The Cary Arboretum

of The New York Botanical Garden

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Fall Festival October 15

Members of the Arboretum and the general public are invited to celebrate the colorful miracle of Autumn at a Fall Festival to be held at the Cary Arboretum on Sunday, October 15, from noon to 5 P.M.

While scuffing through the Fall leaves, visitors will be able to watch demonstrations of such autumnal activities as cider-making, wine-making, and pumpkin-carving; go for hayrides and carriage rides; learn about such subjects as Fall bulb planting, wild foods, deer management and heating with wood; see a display of antique tools; watch documentary films; ask questions at a plant information booth; learn: vegetable dyeing, how to cure plant diseases, how to take nature photographs, and how to sharpen garden tools.

Free entertainment for adults and children will include a puppet-show, poetry readings and – of course – music. The Arboretum shop will have special plants and gifts for sale.

Several Hudson Valley environmental organizations will be represented at the Fall Festival with their own displays.

The 2,000-acre grounds of the Arboretum will be the setting for the Festival. Visitors will have opportunities to tour the grounds, which afford spectacular views of the Hudson Valley area. Tours will include visits to the solar-heated Plant Science Building, the Arboretum's greenhouses and the Tea House, a miniature chateau-style structure built on the highest point of the Arboretum's property by the late Mary Flagler Cary, after whom the property is named.

The day's activities will center at the grounds of the Gifford House, the Arboretum's Education and Visitor Center on the Sharon Turnpike. Parking will be available on the grounds at no charge.

General admission to the Fall Festival will be $1.50 for adults and 50 cents for children and senior citizens. Members of the Arboretum who buy one adult admission ticket will be entitled to one free ticket.

Scientific Revival in China –

by Thomas S. Elias

On May 18th, 10 American botanists crossed the small covered bridge linking the British Crown Colony of Hong Kong with the Peoples Republic of China. This visit marked the beginning of a month-long tour of research facilities, universities, botanical institutes and gardens, and was part of a pioneering exchange program between our two countries. Its purpose was to re-establish ties with Chinese botanists and botanical institutes, after the 10-year hiatus and turmoil of the cultural revolution during 1965-1975, which had a particularly devastating effect on scientific progress in that country.

We were selected to represent the Botanical Society of America in the re-establishment of ties with Chinese botanists and botanical institutions. Our assignment included re-assessing the current status of botanical research in China, and acquainting our Chinese colleagues with current botanical research in the United States. We hoped that our visit would open doors for expanded exchanges of seed, herbarium specimens, books, journals, and – most importantly – exchanges of scientists and students, and establishment of cooperative research programs.

Our group was, of course, most eager to learn the status of biological sciences in the Peoples Republic of China, since science and technology in China generally were reportedly lagging 15 to 20 years behind other countries. When the cultural revolution finally ended in 1975, an attempt was made to make up for lost time, as it were. An eight-year plan of remedial action was drawn up which included academic exchange programs with other countries, including the United States. The Botanical Society of America, naturally, welcomed this unique and exciting opportunity to apprise their fellow scientists in the PRC of recent developments in their special field of interest.

The visiting U.S. delegation consisted of the following members:
Dr. Lawrence Bogorad (plant physiology) leader of the delegation; Dr. Bruce Bartholomew (systematics and ecology), University of California at Berkeley; Dr. Richard Hageman (plant physiology and agronomy), University of Illinois; Dr. Richard Howard (systematics), Harvard University; Dr. William Schopf (paleobotany), University of California at Los Angeles; Dr. Jane Shen-Miller (plant physiology), National Science Foundation; Dr. Richard Starr (phycology), University of Texas; Dr. William Tai (cytogenetics), Michigan State University; Dr. Anitra Thorhaug (marine botany), Florida International University; and Thomas S. Elias, (systematics and ecology), Cary Arboretum of the N.Y. Botanical Garden.

During our stay, we visited six universities, eight botanical institutes and gardens, several agricultural research institutes or academies, three paleobotanical institutes, and many historically important tourist sites. The itinerary started in Kwangchow (Canton). It then continued to Kunming in the southwestern region, and on to Shanghai, Hangchow, Soochow and Nanking. Eight members of the group then visited Wuhan in central China, while two members, Drs. Starr and Thorhaug, travelled to the Marine Biological Station in Quing Dao on the Yellow Sea. The entire delegation met in Peking several days later for a week-long series of meetings, lectures, and tours, after which brief visits were made to Sun Yat Sen University and to a forest preserve about 110 kilometers southwest of Peking.

Peking Botanical Institute

As we travelled from institute to institute, and from one university to another, several notable features of botanical research programs were particularly evident.

Basically, the organization and structure of botanical institutes parallel each other, except that some are responsible to their provincial governments, while others are administered either nationally or locally. A brief description of the Botanical Institute in Peking, the largest in the entire country, will help to explain the roles of these institutions in the Chinese scientific community:

Founded in 1950, the Peking Botanical Institute, with a staff of over 700, is at present located in cramped quarters adjacent

(continued on page 2)

to the zoological gardens. But new facilities are under construction at present, and as soon as they are completed, major sections of the Institute will move to the northwestern suburbs of Peking, where the botanical gardens themselves are situated.

The Peking Institute is divided into seven departments, in addition to the botanical garden itself. These departments are Plant Taxonomy, Ecology and Geobotany, Plant Morphology and Cytology, Paleobotany, Plant Physiology, Nitrogen Fixation, and Phytochemistry.

Not all institutes are as diversified as the one in Peking, however. The Shanghai Institute of Plant Physiology, for example, with a staff of 200, is a facility totally devoted to that discipline alone. Here, studies concerning photosynthesis, cell physiology, molecular genetics, plant hormones, and microbiology are featured. In paleobotany, centers for research are based at the Nanking Institute of Geology and Paleontology and at the Geological Institute in Peking. Other research on plants, especially tissue culture, plant breeding, plant pathology, and various aspects of plant physiology, are also carried out by various agricultural research stations.

Though the director of each research facility we visited was proud of his organization's accomplishments, deficiencies in each facility were readily acknowledged, and candor about the status of their research provided a ready forum for productive discussions and interchange between us. The host scientists plied the American group with many questions, especially those concerning the current status of research in the West and the techniques and equipment we use. The Chinese continually asked us for comments on how to improve their work and facilities. Considering the small amount of equipment available to them during the past few years, their ingenuity to improvise and their willingness to work long hours, there really was little for us to criticize. Rather, our group's dominant reaction was one of admiration for what the Chinese had accomplished in spite of the difficulties experienced in the recent past.

An intense interest was shown on the part of the Chinese in importing new technology from abroad, rather than to devote time and money duplicating work already done in the United States. Restrictions on scientific publications also are being relaxed. In 1972, a limited number of scientific journals began to reappear, though most of the papers were concerned with applied science only. Recently, however, an increasing number of papers have been published on basic research, and authors are once again beginning to take or receive credit for their scientific writings. We also were told that the number and length of political statements in scientific papers has recently been sharply reduced.

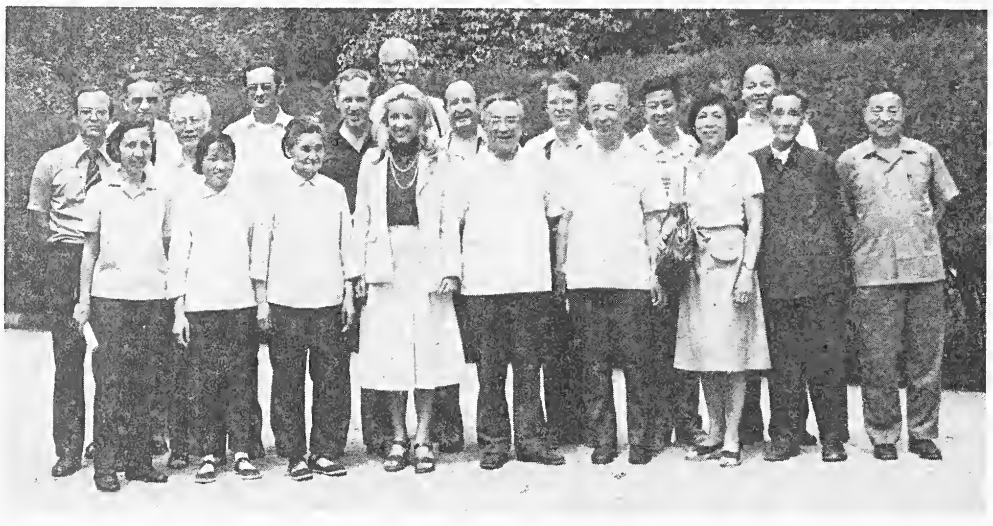
The Chinese are beginning to recognize the need to popularize science in general. We could see evidence of this in the bookstalls, where there were many books and pamphlets on such topics as identification of common insects and plants, tree pruning, use of medicinal herbs and construction of family-sized methane generators.

Flora of China

China has a diverse flora of approximately 30,000 species of plants reflecting a wide array of habitats, ranging from tropical rain forest in the south, alpine and sub-alpine vegetation in the Tibetan Plateau, desert and semi-desert areas in the northwest, and vast deciduous and coniferous forests in the central and northern regions. Virtually all of the country's taxonomists – specialists who identify and catalogue the different plant species – are at present engaged in the monumental task of producing a Flora of China. Plant collecting expeditions have searched the interior reaches of that huge country for plants previously unknown there. These collections are housed in one or more of a dozen botanical institutes. Collectively, China contains approximately 4 million specimens, of which 1.2 million are in the herbarium at the Botanical Institute in Peking, and 650,000 in Kunming. To date, the hundreds of scientists working on this project already have published five volumes of the flora, while an additional 10 volumes are actually in press. The remaining 65 volumes needed to complete the project are scheduled for publication by 1985. Incidentally, it was only two years ago that a similar project was launched in our own country. A national flora of the United States is now being compiled here, and the project is being funded by the U.S. Interior Department and coordinated by the N.Y. Botanical Garden. It is scheduled for completion in the 1980's.

In addition to the national flora project for the entire PRC, scientists in many of the provinces are compiling manuals for the ready identification of the plants in each of their regions or provinces. Moreover, in an effort to popularize their findings, taxonomists already have published a richly illustrated, five-volume flora treating 8,000 of the more commonly encountered species of plants in China.

Dr. Thomas S. Elias



The American Delegation with several senior scientists from the Institute of Peking.

Dr. Thomas S. Elias

Two young women transplanting rice in a field near Kunming in Yunnan Province.

Regional manuals also have been produced for ready identification of the numerous plants traditionally used in Chinese medicine. Botanical gardens in China maintain large and well-kept collections of these plants which are used to help train their "barefoot doctors" – paramedics who help doctors and surgeons by working, primarily, in rural areas and on communes, diagnosing simple problems and prescribing herbal medicines. Botanical gardens and institutes also supply seeds of medicinal herbs to communes, so that stocks of these living plants can be established at each commune. These large communal collections of medicinally important plants probably played a major role in preventing further destruction to botanical gardens during the turmoil of the cultural revolution.

Modern evolutionary biology, including the study of the evolution of plant species and their relationships to each other, has as yet received little attention in the PRC. Studies in reproductive biology and pollination biology also were notably absent, and only a few examples of such studies were apparent to us.

Research Priorities

The Chinese botanists have established an order of priorities in their research. They believe that it is most important to catalogue all the known plants in their country before moving into other fields of botanical research. This is the reason that there are at present comparatively few ongoing research projects involving the use of chemical and cytological data, along with the anatomical detail now afforded by the use of electron microscopes. In addition, the Chinese botanists candidly admit that there is a scarcity of modern equipment to perform such studies. This policy of establishing priorities and then marshalling most of the work force to carry them out was observed in many scientific disciplines.

Chinese botanists consider the following studies as too theoretical, and therefore they are not doing research in these fields, among others, at present: (1) competition between and within species; (2) reproductive strategies; (3) gene flow in populations; and (4) seed dispersal.

In the overall field of ecology, the American group felt that most of the Chinese studies produced to date have merely been descriptive, and contained only a minimum of experimental research relevant to the ecological problems each study purportedly was concerned with. However, as far as they went, these descriptive studies are excellent and sorely needed, as the plants and plant communities in that huge country are as yet so poorly known.

Sightseeing with a Purpose

In each city the group visited, a limited amount of time was reserved for sightseeing

tours to gardens, lakes, and Buddhist temples, and we even visited a methane waste facility which utilized human waste (commonly called night soil) to generate gas for production of electricity. Harnessing of this gas is an increasingly effective conservation measure and is helping China to achieve its goal of self-reliance and independence for energy sources.

Most of the members of the delegation ate only Chinese food throughout the visit. Of course this meant mastering the use of chopsticks to the point where meals could readily be enjoyed without worry about eating messily or dropping food. In addition to our daily meals, we attended ten huge formal banquets consisting of 12 to 14 courses each. Though many vegetables were familiar to us, other foods were not, and we were introduced to such exotica as sea cucumber, jellyfish, calves' stomach, quail eggs, eel and a seemingly endless variety of fresh and salt water fish. Considering this assortment of unfamiliar dishes, few of us encountered food we didn't enjoy. Our hosts also were true to their reputation, and most of the dishes were served extremely aesthetically – a far cry from meals at MacDonald's or at Col. Sanders' Kentucky Fried Chicken eateries!

If our appetite was keen for the delights of Chinese cuisine and for absorbing the sights and sounds of this very different land, it was no match for the Chinese scientists' huge appetite for absorbing information from the west.

According to Chairman Hua, the Chief of State, a key policy decision in the Chinese plan to catch up with more advanced countries is " . . . to learn the strong points of all nations and countries, to learn from them all that is good in politics, economics, military affairs, science, technology, literature, and art. While upholding independence and self-reliance, we should learn from other countries analytically and critically."

Importing technology into the PRC represents the crossing of a bridge by the Chinese in their strenuous national effort to catch up with the industrialized countries of the world in science and technology.

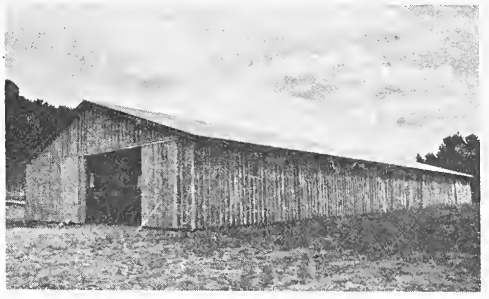
Pole Barn Completed

The "new" pole barn (see photo), recently constructed on Fowler Road, is actually a 15-year-old building that previously had stood in nearby Lithgow. With the help of several CETA (Comprehensive Employment Training Act) employees, the original barn was carefully disassembled, transported five miles to the Arboretum grounds, and then reassembled.

According to Win Schubert, Coordinator of Operations, approximately $12,000 was saved by purchasing this barn and reconstructing it for use as an Arboretum facility. The completed 48 ft. x 136 ft. structure actually cost the Arboretum only $2,800 in outside expenditures.

Special features of the barn are its green fiberglass roof panels which allow the building to be lit naturally, thus decreasing the need for artificial lighting. The building, at present, is unheated.

Robin Parow



The structure is being used for storage and repair of the Arboretum's automotive machinery and large pieces of heavy equipment.

Wildlife Students

During this past school year, the Wildlife Department staff was supplemented by 21 student volunteers from colleges and schools in New York, Connecticut and Iowa.

The students, all of whom received academic credit for the time spent here, worked on such research projects as: (1) analyzing blood and rumen (stomach) samples of deer; (2) determining deer herd age and sex ratios; (3) studying summer habit preferences of a herd of marked deer; (4) productivity of deer through ovary analysis; (5) trapping and tagging of deer; (6) gene flow in mice; and (7) determination of population densities in meadow voles.

The series of projects was planned and organized by Jay McAninch, the Arboretum Wildlife Biologist. The students, most of whom are wildlife or biology majors, were: Joy Auclair, University of Connecticut, Storrs, Connecticut; Ann Baker, S.U.N.Y. at Stonybrook, New York; Karen Budwill, Vassar College, Kathy Campbell, Vassar; Mark Ellingwood, U. Conn., Mark Gruenwald, Dutchess Community College; Nancy Hall, Millbrook School, Millbrook, New York; Ann Ilg, D.C.C.; Susan Jenks, Vassar; Gary Kneipper, D.C.C.; Connie Krustas, Vassar; Keith Loris, Vassar; Kurt McAninch, Iowa State University, Ames, Iowa; Chris Nero, D.C.C.; Marilyn Rice, U. Conn; Caroline Rowntree, S.U.N.Y. at New Paltz, New York; Woody Setzer, S.U.N.Y. at Stonybrook; Richard Terpening, D.C.C.; Mike Ticcony, D.C.C.; Robert Tierney, S.U.N.Y. at New Paltz; John Wilson, Cornell University, Ithaca, New York.

People at the Arboretum

Fred Johnson, Security Supervisor . . . is the man who patrols the 2,000-acre Arboretum long after other staff members have gone home at the end of each working day.

Married 37 years, Fred and his wife, Eleanor, live in Elizaville, where they enjoy gardening and browsing through local flea markets. They have a son, a daughter and two grandchildren.

"I've never collected unemployment insurance . . . ", he says with justifiable pride. Since 1929, when he had to quit school at the height of the Depression, Fred has held a variety of jobs. He worked not only as a photostat operator and a security supervisor for R.H. Macy Co., but he also spent 22 years with the NY Fire Department as a chauffeur, building inspector, and "tillerman" of a huge hook-and-ladder fire truck.

But, if that isn't enough of an impressive work record, after retirement from the Fire Department with the rank of Acting Lieutenant, Fred worked as a monument setter in Pleasant Valley, N.Y. for 12 years. He then joined the Cary staff in 1972, and he says he is amazed at the progress the Arboretum has made since that time, as reflected in its buildings and plantings.

Fred admits that driving around at night used to get lonely sometimes, and he is delighted that "there are boarders now" to break the monotony. Of course, he is referring to the recently-arrived NYBG horticulture students, who have been living on campus during the Arboretum phase of their course work. "The girls let me sample their cooking . . . things like cold cucumber soup, stir-fried chicken, vegetarian dishes . . . "

Our man has many interests. In addition to acting as Chairman of the Gallatin Zoning Appeals Board, Fred is a trustee of the Elizaville Methodist Church, a member of the Royal Arch Masons, the King Solomon Council, and the Lafayette Commandery. He also does his share for the Humane Society: he owns three dachshunds, and feeds stray cats . . . Obviously, Fred is a big man with an equally big heart of gold!

Robin Parow

Dr. Karnosky Receives New Grant

Dr. David F. Karnosky, the Arboretum's plant genetecist, and the New York City Parks Department soon will be cooperating on a research project in Millbrook, thanks to a grant of $11,000 which Dr. Karnosky recently received from the Eppley Foundation.

The research, which is scheduled to begin in January 1979, will attempt to identify the causes of two diseases that are seriously undermining the health of thousands of London plane trees *(Platanus acerifolia)* which line the city's streets.

The trees, which grow rapidly and have an attractive, flaking bark, are similar to the native American sycamore *(Platanus occidentalis)*. But recently, they have been exhibiting various signs of decline, and many already have died.

There is evidence of two distinct syndromes affecting them, and officials of the Parks Department will cooperate with Dr. Karnosky by providing sample tissues from those trees which are suffering from one or the other of the diseases. Dr. Karnosky will then analyze these sample tissues in the laboratory in an attempt to isolate the organisms that are causing the trees to decline or die.

Dr. Karnosky recently was named co-chairman of the Genetics Working Group of the Gifford Pinchot Consortium for Environmental Forestry Studies. He has been an active member of this group for four years, during which time he received two grants from the Consortium to support his studies of genetic variation in air pollution tolerance of trees.

Dr. Karnosky recently attended two professional society meetings. In August, he took part in the 3rd International Congress on Plant Pathology in Munich, Germany. Earlier, he attended the annual meeting of the Northeastern Forest Tree Improvement Conference at Pennsylvania State University. Dr. Karnosky presented a scientific paper at each conference.

Around the Arboretum

"Hort' Students at Cary

Cary Arboretum has just completed its first summer term as a campus for full-time students enrolled in the School of Horticulture of the New York Botanical Garden.

Eight students spent the summer learning practical horticulture work such as tree maintenance, surveying, plant identification and a variety of other tasks. Their program also included lectures by Arboretum staff members and visits to places of horticultural interest in the area. They were lodged in buildings on the Arboretum grounds.

In September, the summer students leave, and a second group of students from the Bronx campus take their place. The second group will be at the Arboretum until Spring.

New Items at Arboretum Gift Shop

A number of attractive, useful new items have arrived at the Arboretum Gift Shop and more are on the way.

For the fashion-conscious plant person, there are umbrellas in a design of the Conservatory of the New York Botanical Garden — an "in" item this year, which marked the reopening of the restored "crystal palace" in the Bronx.

The shop also has received quality garden tools and equipment, including bulb planters, pruning shears and rain gauges. Hand-waxed candles and incense in four botanical scents are now in the Shop collection. The selection of posters and gardening handbooks has also been enlarged. Other items expected soon include stuffed toys and material for making potpourris.

Members and the public are invited to see the new Shop items at the Gifford House on Sharon Turnpike. Members, as usual, receive a 10 per cent discount on all purchases. Proceeds will benefit educational programs at the Arboretum.

Soviet Botanists at Cary

Three Soviet botanists were guests of the Arboretum in late June, as part of the continuing U.S.-U.S.S.R. exchange of botanical scientists, which was instituted and is coordinated by the Arboretum.

The Soviet group, the third botanical delegation to pay a scientific visit to this country under the international exchange program, included: Dr. Lilian S. Plotnikova, senior researcher, Main Botanical Garden, Moscow; Dr. Leonid I. Malyshev, Director, Botanical Garden of Novosibirsk, Siberia; and Dr. Isa O. Baitulin, Director, Botanical Garden of Alma Ata, Kazakhstan.

Robert Hebb, Arboretum horticulturist, escorted the group for a visit to Harvard University's Arnold Arboretum in Boston, and also led them on a one-day tour of the Cary Arboretum. Dr. and Mrs. Payne then entertained the Soviet visitors at a reception in their home.

Tillman back from Venezuela

Dr. Gus Tillman, the Arboretum's ecologist and wildlife expert, recently returned from a three month's stay in Venezuela, where he advised the University Pedagogical Institute in Caracas on how to organize and establish an environmental research program. His visit was under the auspices of the United Nations Scientific and Cultural Organization.

Southern Dutchess Visitors

A group of prominent Dutchess County businessmen and officials, many from the southern part of the County, toured the Arboretum in early July. Dr. Payne and Noel Schetter, an Arboretum volunteer from Fishkill, organized the group and acted as tour guides. Among those present were State Assemblyman Glen Warren, and Mrs. Warren; Roy Ketcham, the well known Dutchess County businessman, and Mrs. Ketcham; J. Perry Dilworth, acting director of the Texaco Research Laboratory, and Mrs. Dilworth; and Richard M. Whalen, Millbrook realtor. Mrs. E. Vail Watson, of Beacon, N.Y., another active Arboretum volunteer, assisted with hospitality.

THE CARY ARBORETUM
of
THE NEW YORK
BOTANICAL GARDEN

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